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Economy in Working Railroad Trains.

"Herapath's Journal," (Eng.) says:—"Mr. Waddington adopts a plan for saving working expenses, which it would be well in other railway managers to follow, inasmuch as it brings the enterprise of private individuals to bear on the management of a railway.

Mr. Waddington gives his superintendent of locomotives a per centage of the gains he (the superintendent) effects by economy in the working of the trains, and the locomotive superintendent contracts with the engine drivers to do the work at a certain rate of expense. It is truly wonderful how much fuel, &c., an intelligent engine driver can save by careful and clever management. By regulating the fires to the work to be done, the time of commencing and completing the several sections of the work, &c., a man of experience and good common sense can save an incredible amount of fuel. The engine driver undertakes the contract of running a train, finding his stoker and the fuel. He prefers employing his own stoker, because the difference in the ability of stokers to economize is great.

The operation of such arrangements is to direct by the most powerful of all human motives of action, self-interest, the minds of engine men, and those under him, to the important matter of economizing fuel and other materials used in the running of a train. Instead of wasting fuel on the road by burning more than is necessary, allowing bits to tumble on the road as the engine proceeds, and by the hundred other ordinary means of wasting, the engine driver and his assistants are made keenly alive to getting the largest amount of work out of the consumption of a given quantity of material, to keeping it from wasting, and otherwise effecting economy. The benefit in every point of view is enormous. Not only is a direct, immediate, and large saving obtained, but by this means we are developing the inventive and cautionary faculties of a number of able, though uneducated men, and enlisting in the railway service only such men as are efficient to perform their work satisfactorily. We understand that a saving of nearly half the ordinary consumption of coke is by no means extraordinary."

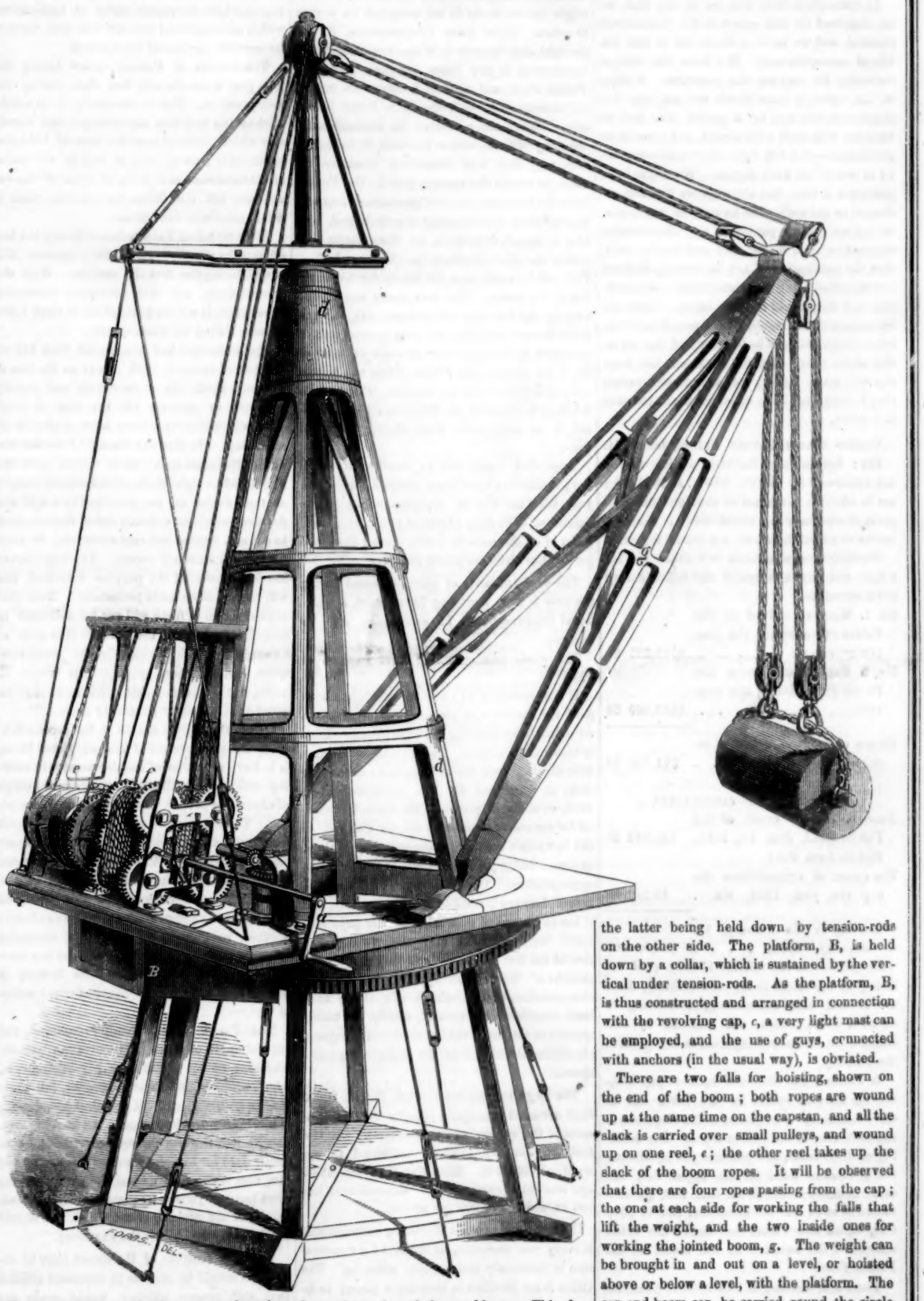
Fire Escapes.

Means of escape from houses on fire have recently been adopted by the police of London.—They have stout canvass sheets prepared, which are stretched beneath the house on fire, and into which the persons in the building throw themselves and are caught. The canvass escape has been tried, and has given the greatest satisfaction as to its utility and safety. Persons who could not be persuaded to descend a fire ladder, have leaped into the canvass without hesitation.

The Fast Voyage.

The new clipper ship "Lightning," (Capt. Forbes,) built by Donald McKay, for a Liverpool house, made the passage from Boston to Liverpool, which former place she left on the 19th February—in 13 days time. She run from Boston to Eagle Island Light in the short space of ten days.

HOLMES' PATENT DERRICK.



The annexed engraving is a perspective view of the improved Derrick of John B. Holmes, 71 Gold street, this city, for which a patent was granted on the 21st of last February.

The main part consists of an upright frame, *d*, placed on a revolving platform, B, on which is fixed a boom, *g*, with two arms, the jointed heels of which are secured in the platform between the central upright frame and the horizontal capstans. On the top of the frame is a revolving cap, *c*, with the mast secured on it. *f* are double capstans; and *e* are reels for taking up the slack of the ropes; *a* is the crank for working the whole machinery. This derrick can be worked by hand, horse, or steam power. A pinion gears into the large wheel of platform B, and moves it round as desired; it can be thrown out of gear when required. The boom, *g*, can be elevated along with the weight to be raised, or it can be held stationary when the weight is being lifted, or it can be raised and the weight held at any position—neither raised nor lowered. One capstan is for working the boom, *g*, and the other for working the lifting block and tackle. The boom is suspended from the top of the revolving cap, the latter being held down by tension-rods on the other side. The platform, B, is held down by a collar, which is sustained by the vertical under tension-rods. As the platform, B, is thus constructed and arranged in connection with the revolving cap, *c*, a very light mast can be employed, and the use of guys, connected with anchors (in the usual way), is obviated.

There are two falls for hoisting, shown on the end of the boom; both ropes are wound up at the same time on the capstan, and all the slack is carried over small pulleys, and wound up on one reel, *e*; the other reel takes up the slack of the boom ropes. It will be observed that there are four ropes passing from the cap; the one at each side for working the falls that lift the weight, and the two inside ones for working the jointed boom, *g*. The weight can be brought in and out on a level, or hoisted above or below a level, with the platform. The cap and boom can be carried round the circle together, and by placing the working machinery, capstans, &c., opposite to the weight to be hoisted, they form a counterbalance to that weight on the platform. Two coils of rope will be observed on the two horizontal capstans; these capstans, being worked by the main shaft of *a*, are capable of being thrown in and out of gear with that shaft, to work either capstan and reel, singly or altogether, as required. They are also geared for a fast or slow motion, for light and heavy hoisting. It will be observed that by elevating the boom, the

circle described by the hoisting lever can either be increased or diminished—a very important arrangement. It is the most perfect derrick we have seen, and will no doubt come into general use, as its principle can be applied to the common mason's derrick as well as any other.

More information may be obtained from Mr. Holmes, either by letter or calling upon him at his shop, where a working model can be seen at all times.

Commissioner of Patent's Report for 1853.

We hereby publish the Report of the Commissioner of Patents, for the last year, in advance of its regular publication by Congress,

In connection with this let us say that we are indebted for this report to the Polytechnic Journal, and we have no doubt but it was obtained surreptitiously. We have the *highest* authority for making this assertion. A copy of this report in proof sheets was put into our hands a month ago, by a person who had no business with such a document, and some of its particulars—in a few days afterwards—appeared in one of our daily papers. We might have published it then, but although we like and endeavor to get such news as early as any paper, we cannot become parties to any dishonorable transaction, and we consider and have so said, that the publication of any document obtained surreptitiously, is a gross immorality—dishonorable and disgraceful in every sense. These are our sentiments in conducting a periodical devoted to improvements in the arts and the elevation of our race. Had the document not been already made public, we assure our readers that it would not have appeared in our columns at present.

UNITED STATES PATENT OFFICE, Jan. 1854.

SIR: Agreeably to the 14th section of the act approved 3d March, 1837, entitled "An act in addition to the act to promote the progress of scienence and useful arts," I have the honor to submit herewith my annual report.

The following statement will show the receipts and expenditures of the Office during the past year:

No. 1. Moneys received at the Patent Office during the year 1853, ...	$121,527 45
No. 2. Expenditures from the Patent Fund during the year 1853, ...	$132,869 83
Excess of expenditures over receipts, ...	$11,342 38

No. 3.

STATEMENT OF THE PATENT FUNDS.

Amount of the credit of the Patent Fund, Jan. 1st, 1853,	$40,292 38
Deduct from this:	
The excess of expenditures duing the year 1853, viz. .	11,342 38
Leaving in the treasury, 1st January, 1854, ...	$28,950 00

In addition to the amount already paid for fitting up the rooms in the new building, there are several bills outstanding, amounting to about $3,500, which will diminish by that amount the sum above reported as being still in the treasury.

A contract has also been made to pay $10,800 for the iron frames for the lower tier of cases necessary to be placed in the large hall in the east wing of the Patent Office. The finishing of those cases, and procuring an equal number of cases of wood for the upper tier, and other necessary fixtures for that hall, are estimated to swell this last-mentioned sum to $30,000, which would more than absorb the entire amount in the treasury to the credit of the Patent Fund.

There are, besides, at least 2,300 applications which have been rejected by the Office, in which the amounts liable to be withdrawn have not yet been demanded. In each of these the applicant is entitled to withdraw two-thirds of the fee paid by him, making at least $46,000 of additional liability subject to be called for at any time.

From the above statement it will be seen that the Office has already incurred liabilities which it is unable to meet. A justification for the course pursued will, it is hoped be found in the great necessity of the case.

Congress had made no provision for these expenses. The convenience of those connected with the Patent Office required the furniture which has been procured; and the condition of the models, which are to occupy the large hall in the east wing, imperatively demand that this hall should be fitted for their reception at the earliest day practicable. Had the matter been postponed till Congress should make the necessary appropriation, much time might elapse before the bill for that purpose would become a law. Sixty days notice must then have been given before the contract could be made, and several months more for the contractors to complete the works, so that the hall might not be ready to be occupied for a year to come. Under these circumstances, it was thought expedient to take the responsibility of contracting to pay these expenses from the Patent Fund, and trust to Congress to refund the amount so far as it should be found necessary. Should these reasons be deemed sufficient to justify the course pursued, it is respectfully suggested that immediate measures be taken to refund the amount paid by the Patent Office for furniture, to meet the amount that will be due when the iron cases are delivered, and also to furnish the means for immediately providing the other furniture for the large hall.—This will be ready in a few weeks for the reception of the cases. The iron cases are to be here by the first day of February next, and the other fixtures can also be soon completed, if contracts for that purpose be made at once.—If all this is done, the Patent Office will have a little over $40,000 in its treasury, which, considering the liability for withdrawals above stated, is not much more than should be found there.

Appended hereto will be found a list of all the patents that have been granted during the year, together with an alphabetical list of the patentees, with their places of residence; also, a list of all the patents which, during the same period, have become public property.

The whole number of patents issued during the year is 958, including 24 reissues, 3 additional improvements, 12 extensions, and 75 designs.

The whole number which have expired is 375.

If the amount of $11,923 35, which has been paid for furniture, as above stated, were to be refunded, it would bring the expenditures slightly below the receipts. The excess of receipts over expenditures would have been about the same as usual but for two circumstances.—First, an undue proportion of the amount expended for agricultural purposes stands charged to the last year's account, in consequence of those expenses being paid from parts of two separate appropriations. Our fiscal year begins on the first of January instead of the first of July, and it has so happened that most of the payments have been crowded into the closing portion of the last fiscal year, and into the first six months of this Secondly, the number and compensation of the clerks in this Office have been considerably increased, mainly in consequence of the act of the last session of Congress, classifying the clerks in the different departments.

The large accumulation of the Patent Office fund occurred principally prior to the establishment of the system of examinations. On the first of January 1837, it amounted to upwards of $300,000. Since that time the average amount of receipts over expenditures has not exceeded $10,000 per annum.

The labor and expense of making examinations is every year increasing as the field for examination is constantly and rapidly widening. The Office is not justified in allowing a patent to issue until fully satisfied, as far as it has the means of becoming so, that the same invention has not been patented in this or any foreign country, nor been described in any printed publication, nor even been discovered in the United States. The models and portfolios of the Patent Office, and all printed publications in the library are, therefore, to be constantly examined, and, as these rapidly increase, the labor is augmented somewhat in the same proportion.

To give some idea of the amount of this labor, and of the rapidity of its increase, it may be stated that there are now in the office very nearly 25,000 models, and about the same number of drawings in the portfolios. The number received within the last nine years is a little upwards of 17,000, and the number filed within the past year nearly 3,000.

The number of volumes in our library at this time is about 5,750: in 1847 it was only 1,850.

There have been 1,550 added during the past year; most of these are works which require to be frequently referred to by the examiners in the course of the year.

From these facts it can be understood how the labor of examination is constantly increasing, and how the examinations of applications which once required but one examiner can now be scarcely performed by eighteen.

The number of Patents issued during the past year is considerably less than during the year previous. This is principally to be attributed to the fact that the changes and vacancies which occurred near the close of 1852 and in the early part of 1853, as well in the office of commissioner as in those of some of the examiners, left the Office less efficient than it would otherwise have been.

The number of Patents issued during the last six months of the year is 583, against 375 issued during the first six months. With the present force, and their constantly increasing experience, it will be practicable to issue 1,200 Patents during the ensuing year.

The arrearages had augmented from 155 on the first of January, 1852, to 481 on the first of January, 1853. They constantly and rapidly cotinued to increase till the first of July, since which time they have been gradually diminishing. On that day the act of the last session of Congress took effect, which gave the Patent Office eight clerks of the second class.—As their duties are not precribed by law, it was deemed expedient to detail one of their number to act as a second assistant examiner, in each of the six examiners' rooms. The experiment has fully answered the purpose intended, and will require to be made permanent. Even that augmentation of force will not be sufficient to keep the business of the Office in that state of forwardness which the wants of the country require, and additional arrangements should be made, if it is intended that applications shall be acted upon promptly as soon as made.

One of the objects sought to be accomplished by the appointment of this additional force, is to have a number of suitable persons in training, and ready to fill any vacancies in the corps of examiners proper, that may at any time occur. These vacancies not unfrequently result from resignations, caused by the fact that a person well qualified for an examiner finds a more profitable employment elsewhere than in the Patent Office. One remedy for this would be to increase the compensation of the examiners: another, to prepare for filling the vacancies when they occur. The latter of these has been to some extent resorted to; the former, if deemed desirable, will require the further action of Congress.

The Patent Office should command the highest order of talent. There is no person, whatever be his abilities or his attainments, who would not find, as an examiner, full exercise for all his talents. A practical sound sense is nowhere more important. All learning connected with the arts and sciences finds here an ample field for exercise; and even questions of law, that tax to their utmost the abilities of the most learned jurists, frequently present themselves for the decision of the Office, and should be rightfully decided by the examiner.

The compensation of the lowest class of examiners should be such as to command abilities that, with proper training, would grace the highest; and the compensation of all should be sufficient to induce each one in this employment to content himself with making it a business for life, as the information he is daily acquiring is constantly increasing his usefulness.

From the fact that the Office during the last six months has been constantly gaining upon the work before it, there may be thought no necessity for an augmentation of its force. But the exertions of the past six months have rather overtasked some of the examiners; and as the number of applications is annually increasing, it will be very difficult to overcome the heavy arrearage still standing against us.—When that is effected, much of the force of the Office might be very advantageously employed in digesting and indexing the books of reference belonging to the Office.

From the present number and rapid increase of our models, drawings, and books of reference as above shown, it is evident that the only way of preventing the Office from being overwhelmed with its increasing labors, is by systematizing and arranging every thing.

The increased space, of which we have an early promise, will enable us to do this with regard to the models and drawings; but with regard to the books of reference the case is more difficult. Many of these are wholly without indices. In other cases works containing from fifty to a hundred volumes have only a separate index to each volume. A reasonable amount of time appropriated to consolidating these indices, and to digesting and arranging the works in the library, would be undoubted economy; and by promptly reducing all new works to the same system of order and arrangement, augmentation will not tend to produce confusion, or even sensibly to increase the labor of examination.

Any increase of force will absolutely require increase of room for its accommodation. But for this difficulty a further number would before this time have been detailed on this duty, sufficient to have disposed of the greater portion of the present amount of arrearages, so that an application could have been acted upon within a few days after it was filed. The inability to do this is one of the greatest grievances of which inventors have to complain, and should be soon removed.

In fact, the present accommodations are altogether insufficient for the present force: one set of examiners, consisting of the principal and his two assistants, have to occupy a single room. Applicants and their agents must constantly have more or less intercourse with these examiners: the models of cases under examination are thus to some extent exposed to the observation of those who may make an improper use of such an opportunity. There should be the means of preserving greater secrecy than is now possible. Each set of examiners should be provided with two rooms, into one of which, containing the models of cases under examination, no one except a sworn officer should ever be permitted to enter,

The limited space assigned to the models in the Office has long occasioned serious inconvenience, and been the cause of just complaint by inventors. The crowded condition of those models not only prevents a proper arrangement, but necessarily exposes them to constant danger of injury and destruction. A large portion of them are consequently in a crippled condition, very discreditable to the Office, and detracting much from its usefulness.

So far as the patented models are concerned, this difficulty will be remedied as soon as the large hall in the east wing is ready for their reception. The space they now occupy will be barely sufficient, when divided into suitable rooms, for the proper accomodation of the library, the examiners, and the machinist.

[Remainder next week.]

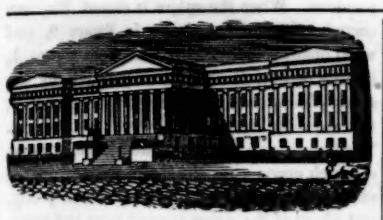
What is Flying?

MESSRS. EDITORS.—It cannot be demonstrated by the known laws of mechanics that birds can fly, yet birds do fly. Therefore birds are in possession of a power unknown to mechanicians.

Will some of the readers of the "Scientific American" prove the fallacy of the syllogism by demonstrating that birds can fly by the known laws of mechanics.

The sailing of eagles, vultures, &c., is alluded to, which are noticed to move through the air, without any apparent exertion, or motion of the wings, for a length of time sufficient for the resistance of the air to have entirely overcome their impetus, and to have arrested their motion, or the force of gravity to have brought them to the earth, yet their motion is not retarded, and they are seen to have ascended higher than when first observed. J. B.C.

Jackson, Tenn., March, 1854.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 21, 1854.

MACHINE FOR DISTRIBUTING TYPES—Victor Beaumont, of New York City: I claim, first, the combination called distributing channel of the channel sides, the levers and slide, with two springs, and the lever and rod, or their equivalent, as described.

Second, the combination of distributing and receiving channels, with disk and ring, and eccentric shaft, or their equivalents, by which the distributing and receiving channels are brought into contact along a curve the last element of which curve is perpendicular to their faces of contact, as described.

GRAIN AND GRASS HARVESTERS—Henry Green, of Ottawa, Ill. Ante-dated Sept. 21, 1853: I claim, first, the V-shaped space or zig-zag shape of the rear of the sickle teeth, or the equivalent thereof, the angles of which press the substances back which collect upon the fingers, and prevent them from clogging the sickle.

Second, extending the rear ends of the sickle teeth back behind the sickle bar whether made as represented or broader, or extended back to a point.

Also sharpening said rear-ends so as to cut off any stalks, grass, etc., which may collect upon the fingers between the sickle and the stock.

Third, terminating the sickle stock at the inside of the rail, and fastening them together, as described, thereby permitting the sickle and stock to travel near the ground and parallel with it, while the rear end of the carriage is carried so high as to clear the grass or grain cut at the previous swath.

COMPOUNDS FOR EXTINGUISHING FIRES—Ralph Bulkley, of New York City: I claim the application to ships and buildings of a composition of fossil and vegetable substances, which will transmute by the action of fire in close places, and produce a predominant smoke that will extinguish common fire, as described, using for that purpose the aforesaid compound, or any other substantially the same, and which will produce the intended effect.

[Another Fire Annihilator, eh]

MACHINES FOR RUBBING TYPE—Daniel Moore, of New York City, (assignor to G. S. Cameron, of Charlesten, S. C.): I claim, first, the centrifugal supply plate combined with the conducting plate, by means of the channel, or its equivalent, to pass the type, as specified.

Second, I claim the elastic roller moved by a pinion and spur wheel, to separate the types, as specified.

Third, I claim the stones, or similar cutting surface to operate first on the type, as described.

Fourth, I claim the use of two or more pairs of cutters, the lower ones being connected by the bridges to remove the projections and rub the type, as specified.

Fifth, I claim the brushes to clean the type prior to delivery from the machine, as specified.

Sixth, I claim the means shown, consisting of the ring and screw nut, for changing a whole set of the fingers, according to the thickness of type, to be rubbed, as specified.

SAFE LOCKS—F. C. Goffin, of New York City (assignor to A. B. Ely, of Boston, Mass.): I claim the arrangement of the sectors in such manner that a part of the number shall have the portions above the slots of a radius greater than the rest, so as to project beyond the other sectors, and with smooth peripheries, in the manner set forth.

The arrangement of slot holder and notch holder with the sectors, by which, while the former engages with all the sectors, the latter engages with those only that have not a smooth periphery, as described.

The arrangement of the slot holder or slot and notch holder, and their catches, with the slotted or slotted and notched sectors, in relation to the key hole, as described.

[Mr. Goffin has invented several very ingenious improvements in locks, and this may be reckoned among the best.]

IRON SAFES—Obadia Mariand, of Boston, Mass.: I do not claim the lining of safes with soap stone, independent of the means of attaching it to the outer plate or shell and of protecting it from breaking, as this has been done before.

But I claim the combination of a lining of soapstone or other suitable material with the internal protecting plate, on the inner surface of the door, when the said lining is constructed as described, so as to dispense with any metallic connection, between the outer metalic casing, and the internal surface of the door, whereby I am enabled to avoid the heat of conduction passing from the outer to the inner surface of the safe as set forth.

MACHINE FOR DRESSING SPOKES—R. P. Benton, of Rochester, N. Y.: I claim the arrangement producing these different movements, as set forth, viz., the shafts, frame, carriage, with its grooves, elbow lever, and bolt, or their equivalents.

LIFTING JACKS—J. W. Bliss, of Hartford, Conn.: I claim the combination of the toothed cams with the lifting frame or slide, arranged and operating together as set forth; when the said cams are so constructed at their finishing extremities as to form a bearing surface on either side of the centers of the axes of the cams, where by the jack is made self-setting, and is restrained from flying from its set, as specified.

PROCESSES FOR DYEING—C. T. Appleton, of Roxbury Mass.: I do not intend to limit myself to any particular machinery for the purpose of producing the reciprocating motion of the cloth, as this forms no part of my invention, and a great variety of machinery may be employed for the purpose, which may be actuated either by hand or by other power. And I do not intend running the cloth through the machine from end to end, back and forth, as has heretofore been practiced in machine and hand hand dyeing.

But I claim communicating to the goods while in the vat, a reciprocating motion back and forth of at least double the distance from the upper rollers to the surface of the liquor, so as to insure the immersion of the whole material once for each vibration, by which means I am enabled to give the whole of the fabric any required number of dips, and to interrupt the operation at the instant the desired shade is attained, as set forth.

HYDRAULIC ENGINE—A. C. Carey & Jeremiah Smith, of Ipswich, Mass.: We do not claim pistons attached to a crank shaft and working by the force of the water, alternately in trunks or cylinders, for the purpose of applying water power to the propelling of machinery.

We claim the peculiar arrangement of the valves and piston heads as herein shown and described, viz.: The piston heads being moveable or hung upon centers, and opened and closed by means of rods acted upon by pins or studs at each end of the strokes of the pistons. The valves being opened and closed alternately, by means of the pins on the crank shaft acting against the arms, by which arrangement the water is permitted to act not only alternately upon the pistons, but also allowed to escape from the trunk or cylinders when the water has forced them along within the trunks or cylinders, the required distance or length of stroke.

[A notice of the invention is published on page 124 of this volume, Scientific American.]

SCREW WRENCHES—Dexter H. Chamberlain, of Boston, Mass.: I claim making the wrench with a split or double shank, a moveable jaw to embrace and slide on the shank, and a tapering screw or its equivalent applied to the shank so as to be capable of separating the two parts of the shank and thereby clamping the moveable jaw in place on the shank, all as above specified.

[Mr. Chamberlain is a veteran inventor of useful improvements.

CONCAVES OF CLOVER HULLERS—Thomas Carpenter, of Manlius, N. Y.: I claim the manner, as set forth, of thrashing or clearing the hull from the berry of clover see, viz., by passing the seed between two cards, as described, one of the cards being attached to the surface of a cylinder, and the other attached to a concave surface, so that the wires of the cards are in contact. The cylinder being revolved while the concave is stationary, the hulls are rubbed off without danger of cracking the seed, the whole constructed as described.

DREDGING MACHINES—C. H. Fonde and T. B. Lyons, of Mobile, Ala.: We do not claim the wheel with the buckets or scuppers across its periphery: nor do we claim the means of revolving said wheel, or the means of elevating or depressing the same with the view of increasing or diminishing the depth of earth caught by the scuppers.

But we claim a tilting tipper applied to a dredging wheel, said tipper dropping within the outer circumference of said wheel, so as to be in a position to receive the mud discharged from the buckets, as set forth.

Also, the arrangement for causing the tipper to tilt out of the way for the full buckets to pass and return again to its position to receive the mud discharged: and for keeping the tipper in gear with the wheels, so that it will always perform its duties, notwithstanding the difference in their relative positions when raising and lowering the wheel.

We further claim the combination of the latch or dog with the ledge of the bed plate of the bucket, by means of which the bucket is adjusted and held firm while digging and raising the earth, as set forth.

GRAIN THRASHERS—J. L. Garlington, of Snapping Shoals, Ga.: I claim the employment of a vertical revolving adjustable and springing disk, made elastic by means of a spring bearing against the end of its shaft, and adjustable by set screws which pass through the ends of the spring, and throw it into action to a greater or less extent, according as they are turned, and having a series of beaters set tangentially to its axis around its face, and another series placed radially round its periphery, in combination with a stationary concave, having a series of stationary strippers arranged tangentially to the axis of the revolving disk on the inner face of one of its sides directly under the passage where the grain is fed in, and another series of stationary strippers placed radially for a short distance round its inner periphery; the whole being constructed, arranged, and operating as set forth, for the purpose of effecting the objects specified.

[See notice of this improvement on page 60, of this volume, Sci. Am.]

NIPPERS FOR PRINTING PRESSES—Chas. W. Hawkes, of Boston, Mass.: I claim the device described, for removing the sheet from the form after the impression has been given, as set forth.

Second, I claim the nipper frame constructed as described, for the purpose specified.

HARVESTERS—P. H. Kells, of Hudson, N. Y.: I claim laying the bar which carries the cutting teeth, ranging with the guide roller and perpendicular to its side face, when the axis of said roller is parallel to the axis of the driving wheel, for causing the cutter bar to conform to the surface of the ground passed over and for the prevention of accidents to the cutting teeth as set forth, said bar being on the gearing side of the machine.

RAILROAD CAR WHEELS—Jordan L. Mott, of New York City: I do not claim the making of hollow railroad wheels, that is, wheels with two plates connecting the hub and rim, nor making wheels with separate hubs for the two plates.

But I claim making railroad wheels with the outer face of any of the usual forms in combination with the inner plate of a conical or nearly conical form connected with the axle towards the middle of its length, to brace the rim of the wheel to resist lateral thrusts and greatly reducing the liability if not entirely avoiding the breaking or bending of the axle, all as specified.

SELF-FASTENING SHUTTER HINGES—Ambrose Nicholson, of Poland, N. Y.: I do not claim locking the shutter by its up and down motion, that being a common device: but I claim the eccentric extension and recess of the plate, in combination with the pin of the plate, by which in connection with the elongated eye, and cylindrical pin, I am enabled to move the shutter and catch it, or release it, without giving it any upward or downward motion, as set forth.

MACHINES FOR DRESSING MILL STONES—J. G. Shands, of St. Louis, Mo.: I claim placing the wiper wheel which operates the arbor and pick on a swinging frame, as described, by which a greater or less length of vibration may be given the arbor, and the pick be made to act with a corresponding degree of force upon the stone.

[An engraving of this useful machine is published on page 76 of the present volume Sci. Am.]

DEVICES FOR PRESERVING HEN'S EGGS IN THE NEST—C. V. Ament, of Dansville, N. Y.: I claim constructing a hen's nest with two peculiarly constructed and arranged chambers, which communicate with each other through a hole in the center of the nest, and self-adjusting false bottom under the same, the upper chamber being provided with a suitable nest and a number of false eggs for the hen to set upon; and the lower one is provided with a soft-cushioned surface for the eggs to fall upon, which is made of such shape that the real eggs, as they escape through the false bottom, are caused to roll gradually towards the edge of the bottom, and remain there until removed. The whole being constructed and arranged as set forth.

[We believe this is the first patent ever issued for an improved hen's nest: it is noticed on page 116 of this Vol. Sci. Am.]

ANTI-FRICTION BOXES—A. D. Morris, of Pittsburg, Pa.: I claim furnishing the series of anti-friction rollers, at one or both ends, or at any part of their length, with a series of toothed wheel s (one for each) and an endless chain, as described.

[A notice of this improvement is published on page 268 of Vol. 8, Sci. Am.

DYEING APPARATUS—C. T. Appleton, of Roxbury, Mass. Patented in England, Jan. 7, 1854: I claim the described machine or apparatus for the purpose of dyeing, to wit, the combination of the perforated cylinder, constructed and described, with the force pump, or its equivalent, operating in the manner as set forth.

BELT SAWS—David A. Cameron, of Butler, Pa.: I claim the application of the lever and moveable frame to tighten the saw and to keep it always uniformly tight in the manner set forth.

Second, I claim the sliding collar on the cylinder with adjusting screws by which the saw is brought forward and made to project beyond the edge of the drum.

Third, I claim the conical pins placed in the drum when constructed and used in the manner set forth.

SHOE LASTS—Thomas Daugherty, of Erie, Pa.: I do not claim the mere construction of a last of wood and metal; but I claim the construction of a last consisting of a metanc sheil or casing enclosing wood placed end wise upon the sole and having soft metal pieces upon the sides of the last for the purposes set forth.

MACHINES FOR MAKING BARRELS—G. W. Livermore, of Cambridgeport, Mass: First, I claim forming or shaping the staves previous to jointing them by passing them through a series of pairs of covered rollers in the manner set forth and for the purpose described.

Second, the peculiar construction of the carriage of the jointing machine the bar being made adjustable within the long slots or mortices in the manner set forth.

Third, I claim the combination of the cone, with the spring drivers operating as described, for the purpose of guiding the hoop to the barrel and driving it into place, as set forth.

PORTABLE METAL PUNCHES—S. McKenna, of Cincinnati, Ohio: I do not claim the invention of the punches, the dies, or lever and eccentric as a means of applying pressure; but I claim the arrangement for a portable punch of the tongue, connected jaws, stirrups, punches, dies, lever, and eccentric; as described.

SEED PLANTERS—David Wolf, and Herman Wolf, of Lebanon, Pa.: We claim the combination of annular, revolving, perforated plates with curved grooves on the underside thereof constructed as described.

MACHINES FOR JOINTING STAVES—A. Wilbur, of Lancaster, Pa.: I claim hanging the swing frame which feeds up the staves to the jointing wheel, as that staves of variable widths may be dressed with the bilge necessary for said widths as described.

I also claim in combination with the swing frame, the guides which move with it for the purpose of firmly holding the stave to the jointing wheel or cutters, as described.

CROZING MACHINE—A. Wilbur, of Lancaster, Pa.: I claim so combining the crozing tool with the cutter head as that said crozing tool may be thrown into or out of operation whilst the cutter head continues its rotation by means of the center pin or its equivalent as described.

QUARTZ CRUSHER—Herman Gardiner, of New York City. Patented in England July 5, 1853: I claim the crusher trough having on each side rail reversed inclined plans for the purpose of giving the ball as it is propelled backwards and forwards in the trough a twisting motion, as set forth.

ROTARY SMOOTHING IRON—J. W. Brown, of Hartford, Conn. (assignor to S. M. Folsom, of Charlestown, Mass.) I claim the revolving smoothing iron, heated by means of a spirit or gas lamp internally, or its equivalent as set forth, the whole forming a combination for the purpose of economy in time and saving of labor.

DESIGN.

STOVES—J. F. Allan and J. Stewart, (assignors to North, Chase and North:) of Philadelphia, Pa.

[NOTE.—Six of the applications in the above list were prepared at the Scientific American Patent Agency.—Patentees should not forget our advice to bring forward their improvements with as little delay as possible. Energy and perseverence is necessary to the success of any business, and we have always observed that those who are the most diligent do the best with their patents]

Scientific Memoranda.

ICE CAVES.—Dr. Kane in his recent work on the Arctic Expedition gives the following account of the ice caves, and their echoes:—

Some of the bergs were worn in deep, vault-like chasms, through which a way was practicable to broader caverns within. In the crystal solitudes echoes were startling.

A whistle—your own whistle—you could hardly recognize for the length and clearness of the ring; the clang of a ramrod was heard running down the whole length of an army in review; and when you spoke, your words were repeated through the motionless atmosphere in syllables as long as your breath could hold out to make them. I tried a hexameter we used to quote at home, and it came back to me in slow and distinct utterance, word for word.

FISHING FISH.—In the course of a lecture delivered before the Royal Institute, London, Prof. Owen noticed the peculiar provision in one species of fish for capturing their prey by means of an apparatus attached to the upper jaw, resembling the tackle of an angler. A projecting bone acts as the fishing rod, and from it there depends a bright red substance, that serves the purpose of the bait. The fish, having its body buried in the sand, projects this apparatus, and the smaller fishes that seize hold of the bait are instantly transferred into its open mouth.

STICKING POSTAGE STAMPS.—Complaints have been frequent to the effect, that the postage stamps do not resist friction and tropical climates. After numerous experiments, the English post office authorities have found, that by perforating the postage stamps and using starch gum prepared on purpose, they will not only resist the change of climate, but friction—as by the perforation they become so strongly adhesive, that nothing will deface them.

AN EXTRAORDINARY TIME PIECE.—There is now in the possession of, and manufactured by Mr. Collings, silver smith, of Gloucestershire, England, a most ingenious piece mechanism—an eight-day clock, with dead beat escapement maintaining power, chimes the quarters, plays sixteen tunes in twelve hours, or will play at any time required. The hands go round as follows: One, once a minute; one, once an hour, one, once a week; one, once a month; one, once a year. It shows the moon's age, the time of rising and setting of the sun, the time of high and low water, half ebb and half flood; and by a beautiful contrivance, there is a part which represents the water, which rises and falls, lifting the ships at high water tide as if it were in motion, and as it recedes leaving these little automation ships dry on the sands. It shows the hour of the day, day of the week, month of the year. In the day of the month, there is a provision made for the long and short months. It shows the twelve signs of the zodiac; it strikes or not, chimes or not, as you wish it; it has the equation table, showing the difference of clock and sun every day in the year. Every portion of the clock is of beautiful workmanship, and performs most accurately.

THE TRANSATLANTIC SUBMARINE TELEGRAPH.—Lieutenant Maury, whose authority in the department of science to which he has devoted himself is held in universal respect, has satisfied himself on the practicability of establishing a submarine telegraphic communication between America and Europe, by the way of Newfoundland and Ireland, and has made a special report upon the subject to the Secretary of the Navy, setting forth the grounds of his conviction. He says that from Newfoundland to Ireland the distance is sixteen hundred miles, and throughout the whole way the bottom of the sea seems to be a plateau which has been placed there for the special purpose of holding the wires of a submarine telegraph—so deep as to be beyond the reach of icebergs and drifts, and so shallow that the wires may be readily lodged upon the bottom. The depth of the plateau is from fifteen hundred to two thousand fathoms. There are no perceptible currents or abrading agents at work there, and the waters of the sea are as completely at rest as they are at the bottom of a mill pond. This is known by the fact that the soundings which have been made there show a ground of microscopic shells, among which not a particle of sand or gravel exists. If there had been currents at the bottom of these shells would have been abraded and mingled with sand and gravel; and the fact that they are not so, shows that the depth are not disturbed either by winds or currents.—Consequently a telegraphic wire once lodged there would remain as completely beyond the reach of the accident of drift as if it was buried in air tight cases. Therefore so far as the bottom of the deep sea between Newfoundland, or the Cape on the north side of the straits of Belle Isle, (which is even nearer to Ireland than Newfoundland,) and Ireland, are concerned, the practicability of a sub-marine telegraph across the Atlantic is proved. Lieut. Maury suggests that for the purpose of hastening the completion of a line, which would be of almost incalculable service to our country, government consider the expediency of offering a national prize to the Company through whose telegraphic wire the first message shall be passed across the Atlantic.

Sick Headache.

The following cure for sick headache was furnished to the "Boston Mecical Journal," by Dr. N. S. Folsom, of Portsmouth, N. H.:—

"Take any number of drops of Croton Oil, mix them with flour and molasses, and make as many pills as the drops of oil used. When the patient feels the sick headache coming on, one half of a pill is to be taken every hour in molasses, or something of like consistence, until it acts as a cathartic; and thus treat the sick headache at each attack. If thus taken, each attack will be less severe, and in some cases a few doses a permanent cure. He seems to think the Croton Oil acts in three ways:—1. By increasing the secretions. 2. By counteracting the anti-peristaltic action of the stomach and bowels; and 3, by acting as a counter irritant to the brain."

Rents in London.

Some of our quid nuncs says the "Washington Star," are often curious to know what our representatives at foreign courts do with all the money they get from the government. An item has just come to our knowledge, in regard to a portion of the expenses of the American Minister in London, which will show "how the money goes." He lives in a respectable and decently furnished house, No. 56 Harley street, for which, including a stable, he pays an annual rent, of $3,581 60!

[We have seen the above in a number of our exchanges, expressing surprise at the high rents of London. Mr. Buchanan could not rent such a furnished house with a stable, in this city, for less than a thousand dollars more per annum.

Lime Dust on Plants.

An English orchardist, whose orchard occupies 50 acres, protects, his trees from caterpillars and other insects by shaking over the young folliage quick lime pulverized and sifted through a fine sieve. He puts the lime into a tin conical canister perforated at one end, and with a long handle. The time for using it is in the dew of the morning, or whenever the leaves are damp. He has found it very effectual.

New Inventions.

Ventilating Parlor Stoves.

T. White, and J. R. Parker, of this city, have applied for a patent for an improved ventilating parlor stove. The heated current from the fire is made to descend in a flue between an outer cylinder and the fire chamber, and made to pass through small cylinders surrounding the radiating flues, then up through the chimney. This plan is to keep the hot current longer in contact with the radiating surfaces of the stove.

There is a back draft which admits air through channels in the sides and base (but has no connection with the fire) and meets the hot current as it descends from the fire chamber. This is for ventilation. A flaring radiating flue passes through the center of the top chamber of the stove, thus generating a current of air, which keeps the plates cool, and yet serves as an excellent air heating reservoir. Measures have been taken to secure a patent.

Seed Planters.

Ives W. McGaffey, of Philadelphia, has taken measures to secure a patent for a useful improvement in Seed Planters. The plow has two wings of peculiar construction, which both open the furrow and cover the seed, a roller presses down the soil on the seed after it is planted. The channel for dropping the seed is so arranged that it serves to conduct both the seed and manure into the furrow at the same time—a good arrangement.

Potato Digger.

Mr. McGaffey, has also applied for a patent for a machine for digging potatoes. This machine has an attachment on its front which first throws the cover soil and vines to the right and left off the hills or rows of potatoes, the digger which is placed behind it scoops up the the potatoes which are made to roll towards a separator, when the earth is screened from them, and then they roll into a receptacle perfectly clean. The uncovering device, and the digger which is placed behind it are both adjustable and capable of being set to enter the soil at any required depth.

Screw Propellers.

Horatio O. Perry, of Buffalo, N. Y., has taken measures to secure a patent for an improvement in propellers. The improvement is more particularly applicable to those propellers which are only partially submerged, but is also applicable to the submerged propeller. This improved screw is composed of two or more hubs, from each of which radiates a series of arms, to which the blades are attached, they (the blades) extending only a portion of the distance from the exterior towards the axis of the screw.

Threshing Machines.

Spencer Moore, of Central Bridge, N. Y., has made an improvement on Threshing Machines. It consists in the employment of grain and dust arresters, arranged in such a manner as to prevent the dust and grain from passing upward in the face of the operator or feeder—these arresters cause all the dust and grain to pass through the machine. Measures have been taken to secure a patent.

Improved Lifting Jack.

James P. Howell, Craigsville, N. Y. has applied for a patent for an improvement on lifting Jacks, the nature of which consists in a peculiar arrangement of a lever and pawl, by which the rack of the jack may be raised by the lever and held by the pawl at any desired point, and also liberated from the pawl when desired, and then allowed to desend by merely moving the lever. This improvement, is both simple and good.

Stave Machine.

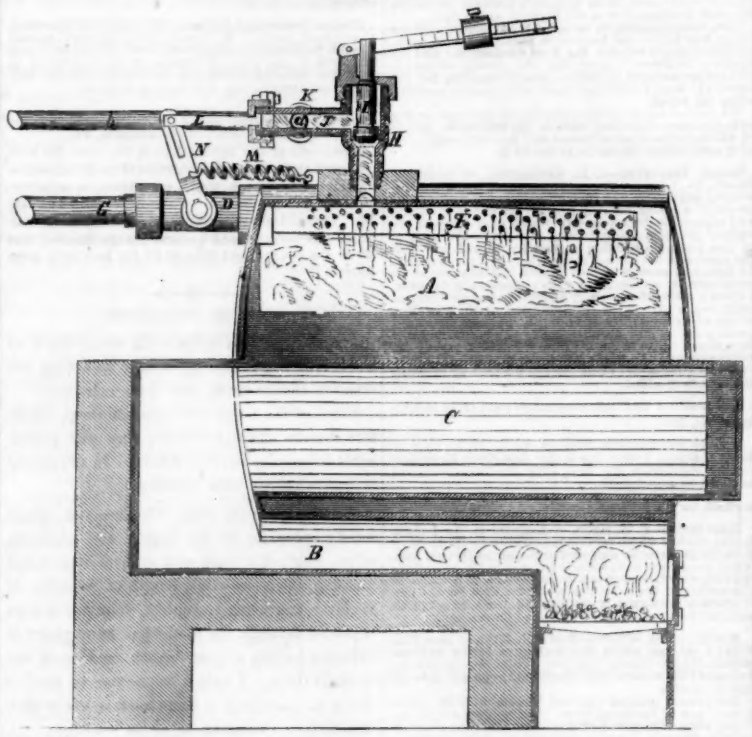
Daniel Drawbaugh, of Eberly's Mills, Pa., has made an improvement in stave machines, the nature of which consists in the combination of a stationary concave, and a vibrating bed, a curved knife and a pressure roller, by which staves are cut from blocks and made in a very perfect manner. Measures have been taken to secure a patent.

Machines for Felting Hats.

James S. Taylor, of Danbury, Con., has made a useful improvement in machines for felting hats. The improvement is made upon a machine, for which he has already received a patent, which consists of a suitable number of rollers placed diagonally to each other, and within a frame, or vat. The rollers are so arranged as to form a cavity or chamber between them of sufficient size to receive the hat, which is forced through the chamber the whole length of the rollers, by their rotation. The rollers of this machine has only one motion, the improvement consists in giving them two or more motions—a lateral as well as a rotary motion, by which the hats are felted in a much superior manner.

CONTROLLING THE STEAM PRESSURE IN BOILERS.

Figure 1.

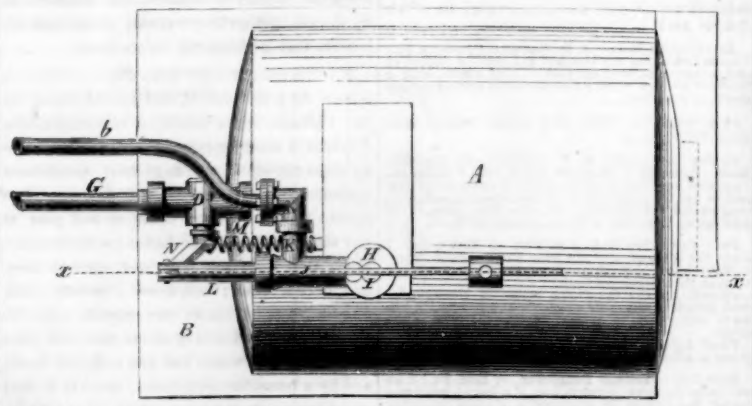


The annexed engravings are views of an invention for Controlling the Pressure of Steam in Boilers, for which a patent was granted to Henry S. Williams. of Malta, Ohio, on the 14th of February last, (1854).

Figure 1 is a vertical longitudinal section of a steam boiler and a safety valve with the improvement attached, taken through the line, *x x*, of figure 2, which is a plan view. The same letters refer to like parts. The nature of the invention consists, 1st, in opening the water cock of a steam boiler, and admitting water in small jets into the boiler by means of a plunger and slotted arm or their equivalents, when operated by the pressure of the escape steam of the *safety valve*, (or at the moment the pressure of the steam rises above a certain mark) and then closing said cock at the moment the steam is reduced to the given pressure, by means of a spring attached to the boiler and slotted arm which connects the cock and plunger together, all for the purpose of reducing the temperature and pressure of the steam, and thus prevent explosions. 2nd. It also consists in starting the steam pump or "doctor," in case it should not be in operation when the pressure of the steam in the boiler rises above the given point, by means of the escape steam from the safety valve, said steam being admitted to the pipe leading to the steam chest of the pump, through a branch pipe of that which carries the plunger. This branch pipe is provided with a valve, which prevents the steam from the "doctor" passing into the boiler when the pump is running, but allows of steam being admitted to the steam chest when the pump is running.

A is the boiler; B the fire chamber; C the flue; D the water cock, having a valve which

Figure 2.



is opened by the pressure of the water from the pump as soon as the spigot is turned by the action of the escape steam; it is closed by the pressure of the escape steam in the inside of the boiler; F is a perforated copper pipe through which the water escapes in small jets, through the steam in the boiler, when it is desired to reduce the temperature and pressure of the same; G is a pipe leading from the water cock to the ordinary pump; H is the safety valve chamber, and I is its valve. Its construction is somewhat different from those in common use, it having a horizontal pipe, J, communicating with it, which pipe has a branch pipe, K, leading to the "doctor," communicating with it, and consequently with the safety valve chamber, H. The pipe, J, receives the plunger, L, and allows it to move back and forth freely, as it is operated upon by the pressure of steam or the spring M. N is the slotted arm which connects the plunger, L, to the water cock, D, this arm is connected fast to the spigot of the water cock, and turns it, and thereby opens or closes it, the slot in said arm allowing of the plunger moving in a straight horizontal line, as will be evident from figure 1. The spring, M, is connected to the slotted arm, N, and to the boiler. This spring causes the arm to turn the spigot, and close the cock after the steam has been reduced to the proper temperature. When the spigot is closed the arm occupies the position shown in figure 2, and when opened, the position shown in figure 1, it being thrown to said latter position by the steam coming into the safety valve chamber, and exerting its pressure upon the plunger. The branch pipe, K, is provided with a valve, *a*, which opens when the steam passes from the safety valve to the "doctor" or steam pump, and allows of the steam passing from the safety valve and through the pipe, *b*, and operating said pump, and setting it running when the steam rises too high in the boiler, or rather its pressure exceeds the given point, and it closes when the doctor is running or commences to run, and prevents the passage of the steam from the "doctor" to the interior of the boiler. The safety valve, I, fits snugly in the top of the chamber, H, and prevents steam escaping when the pressure in the boiler is too high, thus causing all the escape steam to be thrown against the plunger, and in contact with the steam pump in case of necessity, and when the pressure of the steam in the boiler is right, the steam which may be in the branch pipes, &c., is allowed to escape as the safety valve falls from its upper seat and leaves a passage. This arrangement requires no packing, the steam always keeping the valves tight when necessary.

Operation.—Suppose the weight on the end of the safety valve lever to be set for a pressure of 75 lbs. to the square inch, and the pressure gets above that point, the safety valve will rise and close the opening at the top, and allow the steam to act on the plunger and drive it to the position it occupies in figure, 1 which causes the slotted arm to open the cock, D, and admit a supply of water through the perforated pipe into the boiler, which acts upon the steam and cools it down to the given pressure, when the safety valves will close, and by means of the weight will be forced to the bottom of its chamber.

Again, suppose the pipes, K and *b*, be connected together, and that *b* carried to and made to communicate with the steam chest of the "doctor," and that the engine is stopped.—Now let the pressure be greater than 75 lbs. per square inch, the safety valve will rise, the plunger will be forced to the position shown in figure 1, and the cock, D, opened, and the steam will rush through the pipe, K, and open its valve and pass along the pipe, *b*, to the valve chest of the "doctor," and set the engine in motion and cause the water to run into the boiler through the pipe, G, and cock, D, and perforated pipe, F, and reduce the pressure as before.

The claims of this patent will be found on page 187. It is perhaps needless for us to say a single other word in favor of this improvement; all its advantages are so evident that every engineer can see what they are for himself at once.

More information may be obtained by letter addressed to Mr. Williams, at Malta, Ohio.

The Cart Before the Horse.

A novel cart has made its appearance on the *cours la Rein* at Paris; the horses instead of being before are behind the carriage, which is propelled by pushing instead of pulling. A man rides on one of the horses, and another guides the carriage. The merits of this equipage are said to be that the horses not being able to see where they are going, are not liable to be frightened or run away, while the carriage is a warning whistle to guard pedestrians from being run over. Objections are made that two conductors or drivers are needed instead of one—still, it is very possible that the vehicle may come into favor.—[Exchange.

[This is no doubt, one of those equipages, that will run away with the horse, before the horse runs away with it.

An iron statue of Henry Clay has been cast at Philadelphia, to be erected at Pottsville, Pa. It is somewhat larger than life. The model was prepared by a Mr. Washe, a sculptor, and it was cast by Mr. Wood, of Philadelphia.

The engineers of St. Louis, Mo., have struck for a reduction of their hours of labor to 58 per week, and double pay for all over hours.

Scientific American.

NEW YORK, APRIL 1, 1854.

The Crystal Palace Mismanagement.

When at the close of the the London exhibition, it was first proposed to erect a Crystal Palace in New York, and that it was all to be a private speculation, we denounced the whole project, as being anti-national, imprudent, and disgraceful. We asserted that it was foolish to commence a great exhibition so soon after that of the one in London, and that it was arrogant for any company of speculators to stand up as the representatives of our country, magnifying their own private project in the eyes of the whole world as being that of the nation. We had hoped that in the course of five, eight, or ten years after the World's Fair, our country would have an exhibition broad and national in its scope and management, which would be an honor to our Republic and do our countrymen justice in every department of the Industrial Arts. This was our great reason for opposing the New York Crystal Palace, because *it* we conceived, would rob us of a future creditable National Exhibition. In referring to this project on page 172, Vol. 7, two years ago, we said, "it will be a failure; there can be no doubt about that." And a failure it certainly has been, so far as its managers have managed to swallow up the stock, and recklessly involve the Association in debt. In one thing we have been disappointed, namely, in the want of straight forward financiering by its Directors. Who would have thought, when such men as Theodore Sedgwick, William Whetten, Mortimer Livingston, Alfred Pell, August Belmont, Watts Sherman, E. J. Anderson, &c., were at the head of it, that its affairs would have been *so badly* conducted. The stockholders were greatly deceived by the representations of the managers, for in June 1852 they published a card stating that the whole expenses would only be $300,000, while the income would be $729,000, leaving $429,000 as profits. Instead of this being so, the Investigating Committee, appointed by the New Board of Directors, have found that the old Directors have sunk no less than $1,039,000—all the capital of the Association, all the recipts, and left a debt of $178,000 still owing. Miserable managers, they have not left a rag of credit for themselves or their country in conducting the enterprise.

All this has been attributed to the Crystal Palace not being open in season, and the British Commissioners, Lord Ellesmere, Sir Charles Lyell, &c., who came over here to witness its inauguration, make very handsome apologies in their recent report, but it is all sheer nonsense to say that this was the cause of such a waste of money. One of our daily papers, with its usual amount of blundering, in commenting on the affair, asserts that the cause of failure was owing to the pomp and extravagance displayed at the inauguration, and that the managers erred in pursuing a foreign model, beyond the plan of the building itself. Now all this is just the very reverse of what should be said, and springs from a superficial study of the subject. Such ignorance as was displayed in reference to the cost and the labor required to erect the building surpassed all sensible comprehension.

We have ever recommended and still recommend all persons who are able, to visit the Crystal Palace while it remains open, because it is really worth more to any person than the price charged; indeed, it has done vast good, we believe, to the public, although it has entailed heavy losses upon its stockholders. And such an exhibition of the Industrial Arts, if well managed, would, we think, pay well, if kept continually open in this city. If an exhition six times its size can be made to pay at Sydenham, near London, why cannot such an exhibition be managed both for the benefit of the public and the stockholders in this city.

An injunction was issued last week to restrain the new Directors from paying out of the Treasury any money to those who had loaned to the old Directors, in violation of their charter, which specifies that the capital stock, together with the debts of the Association shall not exceed $500,000, which statute, it is alleged by the complainant, has been transcended. The affairs of the Crystal Palace might be resuscitated under proper management, but whether they will be so or not we cannot tell. We have been led to make these comments from reading the recent report of the British Commissioners, in order to explain away the general idea which has gone abroad, that the New York Crystal Palace was a national affair.

Report on the Machinery in the Crystal Palace.

We have now before us a copy of the Report of the Jury on the Machinery and Engineering contrivances that have been exhibited at the Crystal Palace, and we do not remember to have been so much disappointed with any document ever before presented to us. From the reputation of the men composing the Jury, we certainly expected an able and instructive Report.

Its introduction is a shallow attempt at something grand about the progress of the human race, and not even a respectable account is given of the nature, construction, and operation of a single machine on exhibition.

It is so barren, so incongruous, so one-sided, so dull, so doubtful, so short, and so shallow, that we at one time thought of treating it with silent contempt; and were it not to protest against it in the name of the exhibitors of machinery in the Crystal Palace, we really would only say—as its author will yet say—"oh no, we never mention it, its name is never heard." Out of a list of four hundred and thirty-eight machines exhibited, only thirty are named, and the residences of the owners are left for conjecture. There were three splendid large steam engines on exhibition, and yet only one is named; there were two new and ingenious gingham power looms, and some excellent plain ones on exhibition, and yet these are all passed over without a single word said about them, while a paragraph is devoted to a *hand* loom. Not a single word is said about the excellent and beautiful English cotton machinery, or the superb tools of Joseph Whitworth—one of the foreign Commissioners. We protest in the name of all generous Americans against this omission; our countrymen like fair play for friend and foe.

We also had an understanding that none of the Jury were to be interested persons; yet here we find that one of them was awarded a silver medal for a machine. The concluding paragraph of the report is one of the greatest jumbles of sense and nonsense we have ever read. It mixes up weights and measures, patent laws, and machinery, into a dish of the most indigestible hotch potch. The following is a sample of one of its sentences:—"Having to examine more than four hundred machines, for the most part either patented or to be patented, the Jurors have had more opportunities than are afforded in ordinary business of seeing what a number of evils could be suppressed by the enactment of a good Patent Law, and by the adoption of a rational system of weights and measures." Now we must confess that although we have had no small amount of experience in looking through literary millstones, that this sentence puzzles us exceedingly. Perhaps it means that the best way to judge the merits of machines would be either by weighing or measuring them. If such views guided the Jury in examining the machines on exhibition, it may help to account somewhat for this singular report. We feel, however, a kind of choking sensation while we think of it, and we are positive that there is not a member of that Jury who, if he sits down and carefully reads it, but will feel as much ashamed of it as we do. We cannot conceive—we say this at least of some of them—why they allowed such a miserable document to go before the public.—There is something about it which—owing to the reputation of those composing the Jury—demands explanation. Out of respect for the feelings of the friends of the Jurors, we omit the publication of their names in this connection.

To fill out this column we would state that we paid into the United States Treasury in this city, over 1,400 dollars for Government fees on applications for patents filed within ten days.

A Great Railroad---New York and Erie.

We have received from the Chief Engineer, W. J. McAlpine, a copy of the second edition of the Report of the Directors of the New York and Erie Railroad. It is full of instruction to every man who takes an interest in railroads, or who wishes to be well informed of the progress of our country in railroad enterprise. In 1832 the first application was made for a charter, but it was not until 1851 that it was finished. Its whole history as presented in this Report, exhibits a succession of struggles of the most trying nature, against great difficulties, and at last a complete triumph over them all. It is the greatest private enterprise on our continent; its whole length is 495 miles, including the New Jersey branches, on which the cars now run from Jersey City, to Dunkirk N. Y., without changing, but the Road has to pay the abominable Jersey tribute, which is a disgrace to that State. A second track will soon be in operation from New York to Corning, 291 miles. The quantity of iron rails laid in the tracks is nearly 70,000 tuns, and 4 tuns of spikes are used to the mile. There are 25,000 lineal feet of bridging built. There are three large machine shops fitted up with complete sets of tools for repairing and fitting locomotives, and five smaller machine shops. The company has 130 locomotives in use, and contracts have been made for 60 new ones, which are to be delivered in the course of a few months. The total cost of the Road up to the last November was $31,222,824, but there is a great amount of property owned to balance this expenditure. There is one excellent feature in connection with this road, and one which should belong to every other railroad in our country, we allude to a telegraph for especial use. The Report report states that the company have in operation 497 miles of telegraph, 52 offices, and 65 operators, exclusively employed for its own business. "No expenditure," it says, "made on this work has proved more profitable. It has added to the safety of passengers, and has given a feeling of security to the managers and operatives of the road against a large class of accidents, to which, without it, they are peculiarly exposed. When accidents do occur, information is communicated immediately from the nearest station, and assisting engines, cars, and men are dispatched with the greatest promptness, thus saving in every instance a considerable loss of time and expense, besides the advantage of communicating the intelligence to all approaching trains, and avoiding the further damage which has proved so disastrous to some other roads." It gives us pleasure to record the fact of this railroad using a telegraph for its own business. Eight years ago we directed attention to the importance of such an agent to all railroads. They will all come to use it yet. Under the management of such gifted and able officers as this railroad now has, it will, we have no doubt, soon be in a very flourishing condition.

City Dust---Merchants Growing Wise.

Celebrated as our merchants are for shrewdness in business and restlessness of enterprise, yet in many things they have exhibited a great amount of stupidity, in fact, they have acted as if they had no self-consciousness of the possession of eyes, until they were half filled up with such a dust as to threaten blindness. Five years ago we directed their attention to the necessity of having Broadway swept every night, or at least before persons began to traverse the streets in the morning, and it was only on the evening of the 16th inst., that they took active measures to carry out such a reform. A meeting of the Broadway merchants was held that evening in the Astor House, and speeches were made, setting forth the heavy damage sustained to their goods by clouds of dust, carried by high winds through the streets, and which is so fine that it enters every store, and settles down on the finest velvets and silks, as if they were only vulgar calicos.

The meeting passed a resolution expressing their opinion that they had no hope nor confidence in the public authorities ever abating the nuisance; they therefore authorized J. N. Genin to collect subscriptions, to have Broadway swept once every 24 hours, in the morning, before 7 A. M. We hope that the merchants in other streets will follow the example. They will also yet come to adopt the plan we recommended years ago, namely, to have all street repairs, such as *paving* done during the hours of night, so as to have no such obstructions to business and passage during the day.

The American Lock not Picked.

MESSRS. EDITORS.—We notice in your paper of this date an article headed, "Hobb's Lock Picked," in which our names are made the subject of the article in question. You state that "there can be no doubt of the fact that the American Lock of Day & Newell, under the care of Mr. Hobbs, now in London, has been successfully picked."

Allow us to disabuse your mind of this conviction by a statement of facts as they actually exist. It is well known that Mr. Hobbs went out to England in 1851, as our agent to represent our lock at the Great Exhibition of all Nations; the world knows the result of his mission. He picked the Chubb & Bramah Locks with comparative facility, and received the 200 guineas which was offered as a reward for the performance. We then, in order to give England and the rest of the world an opportunity to exercise their skill on the American Lock, at once placed it before the public and offered a reward of $1,000 to have it picked. This challenge was accepted, and after a trial of 130 consecutive days by England's most scientific mechanics, the task was abandoned as fruitless, and the lock returned to Mr. Hobbs unpicked and uninjured, thus establishing the title for the Newell Lock which it enjoys, viz., the "Champion Lock of the World." Mr. Hobbs having by these circumstances obtained a high reputation as a Lock Picker, became identified with our Lock, hence it is called by many in this country the Hobbs "Lock." This, however, is not the case, as the following facts will show:

Mr. Hobbs and other parties are now engaged in the manufacture of cheap locks for ordinary purposes made after various American patterns, which they denominate American Locks. One of this class Mr. H. calls the Protector Lock, designed for desks and tills, which he sells at prices from 5 to 10 shillings each, one of which is said to have been picked by Mr. Goater, foreman of Messrs. Chubbs. Now as we have no connection in the manufacture of these Locks, and as they bear no affinity to ours, we trust you will make the amend honorable by placing the matter before the public in its proper light. DAY & NEWELL.

New York, March 24, 1854.

The American Lock of Day & Newell, then, has not been picked yet. Our cotemporary, the "London Mechanics' Magazine" should not have made such an ado about the picking of the cheap lock of Mr. Hobbs, as it leads the public to believe that it was the bank lock that received the medal and encomiums of the Commissioners at the World's Fair, which had been picked. The lock of Messrs. Day & Newell still remains proof against the skill of the most celebrated English locksmiths.

The Inventor of the Electro-Magnetic Telegraph.

On another page will be found the advertisement of the gifted inventor of the Electro-Magnetic Telegraph—His invention has conferred incalculable benefits upon his fellow men,—he is an honor to his country, and an object of pride to his countrymen. His telegraph is the most simple in use, and standing upon its real merits and just claims it has nothing to fear. Some of his friends, however, without any necessity for any such indulgence, have been as wild and extravagant in their claims, as some of his opposers have been bitter and denunciatory in their antagonism. No one can deny that our country is indebted to Prof. Morse—as being the first inventor—for its splendid and extended system of telegraphs, by which millions are saved to our merchants and newspapers every year, and by which so much pleasure and happiness are derived by friend holding converse with friend at great distances apart. Such a benefactor deserves to be highly rewarded, and we have no doubt but he will meet it.

Water Wheels---The Turbine---Article 2.

[Continued from page 222]

MECHANICS OF UNELASTIC FLUIDS.—9. Fluids are bodies so constituted, that their parts are all ready to yield to the action of the smallest force or pressure, in whatever direction it may be exerted. Every particle of fluid presses, and is pressed equally in all directions, whether it be upwards or downwards, laterally or obliquely; and when in a state of rest, the pressure exerted against the surface of the vessel which contains it, is perpendicular to that surface.

10. The particles of a fluid, situated at the same perpendicular depth below the surface, are equally pressed; and the pressure upon any of its constituent elements, wheresoever situated, is equal to the weight of a column of fluid particles, whose length is equal to the perpendicular depth of the particle or element pressed.

FLUIDS IN MOTION.—11. Fluids acquire the same velocity by issuing out at an aperture, that heavy bodies do by falling a distance equal to their height of head from under which they issue; consequently, by art. 7, the velocity from under any height of head, will be as the square root of that highth.

12. When fluids in motion impinge perpendicularly on a plain fixed surface, the constant pressure against the obstacle, will equal the weight of water that impinges in the fourth of a second, multiplied by the velocity per eighth of a second. For, by art, 8, the force necessary to give the water velocity, is equal to the momentum; and as the water that strikes in the fourth of a second, must necessarily be the fourth of a second in having its motion arrested, the constant pressure will equal this quantity multiplied by the velocity in feet per eighth of a second

The pressure, will equal the weight of water that impinges during the time necessary for a heavy body to acquire an equal velocity by falling from rest. For the quantity that impinges in that time, must necessarily have its motion arrested, during the same time, and, by art, 3, and 7, the constant force necessary to arrest the motion of a body inthe time that it would acquire its motion by falling, is equal to the weight of that body.

Or, the velocity with which the water impinges in feet per second, divided by the velocity acquired by falling one second multiplied into the weight of the quantity that impinges in one second, will equal the constant pressure.

EXAMPLE.—Let a sluice of water one foot sectional area impinge perpendicularly on a plain fixed surface, at the rate of sixteen feet per second; required the constant pressure in pounds.

By 1st. Here, the velocity per eighth of second is 2, and the quantity discharged in the fourth of a second is 4 cubic feet, and $2\times4\times62\cdot5=500$ lbs. the constant pressure.

By 2nd. The time necessary to acquire a velocity of 16 feet per second is 0·5 seconds; and $\cdot5\times16\times62\cdot5=500$ lbs. as above.

By 3rd. $1+632\times16\times62\cdot5=500$ lbs. the constant pressure.

13. When water is compelled to move in a curve it will resist having its direction changed, and if it be whirled round in a cylindrical vessel of any size, it will rise as high in the vessel as the heighth of head necessary to give it an equal velocity.

14. The tendency of fluid particles towards the orifice occasioned by their sustaining less pressure in that direction gives rise to a contraction in the jet of fluid, which, in issuing from the orifice, assumes the form of a truncated cone, whose greater base corresponds to the orifice. This diminution in the size of the jet is called the contraction of the vein.—When the orifice is pierced through a thin plate, the diameter of the vein is such that only ·62 of the theoretical quantity will be discharged. If a tube equal in length to twice the diameter of the orifice be inserted, the quantity discharged will equal ·80; but if the tube be cone shaped, in form similar to the contraction of the vein, then the theoretical quantity will be discharged very nearly.

15. By art, 2, the re-action against a vessel aving an outlet of water, will equal a force necessary to give the issuing water its motion. Sir Isaac Newton supposed it was equal to the weight of a column of water the size of the orifice and twice the highth of the head; which conclusion would have been correct, had the water issued with a velocity equal to that assigned by theory, and in a vein equal to the size of the orifice. But the contraction of the vein (art, 14) causes a diminution in the quantity discharged; unless, however, the smallest part of the vein be taken for the orifice; when Sir Isaac's conclusions will be found very nearly correct

By art, 2, and 12, the re-action will equal the weight of water that issues during the time required for a heavy body to acquire a velocity equal to that of the effluent water by falling from rest.

As fluids press equally in all directions, when a part of the pressure in one direction is taken off by the opening of an orifice, the containing vessel will tend to move, in a contrary direction with a preponderant force equal to that required to give the water motion;—not that the issuing water reacts,—but by art, 2, when a body is found moving in any one direction, it is known that a force equal to that which gave it motion has acted in a contrary direction.

THE RE-ACTION WATER WHEEL.—16. There are but three modes by which water actuates machines; or, more correctly speaking, there are three ways by which the force of gravity, through the medium of water, will propel machinery, viz., 1st. by inertia, generally termed percussion; 2. By gravity, directly; and 3. By pressure, generally termed re-action.

All water motors, whatever may be their construction, are propelled by the force of gravity, through the medium of water, in one or the other of these modes; or by two or more of them combined.

The class of motors actuated by percussion, termed undershot wheels, have, very properly, gone out of use, and will be passed over without notice.

The class actuated by gravity direct are used to some extent, yet it is deemed unnecessary to treat of them here.

17. The most interesting motor, is that class of water wheels propelled by pressure, usually termed re-action water wheels. It is comparatively speaking, of modern origin, and was not until quite recently very highly esteemed, but will, no doubt, when its principles of action are properly understood, and its advantages duly appreciated, supersede all other motors.

The common re-action wheel, as formerly constructed, can only give an effect, approximately, equal to one half the power. For by art, 15, the pressure, or re-action, can only equal the weight of water that issues at the jets during the time that a heavy body would acquire an equal velocity by falling from rest. And, as the water comes into the wheel without velocity in the direction of the motion of the wheel, when the wheel is moving, the water as it enters the wheel is given a motion similar to that of the wheel by the wheel; which requires such a portion of the force, or pressure, as the velocity of the wheel bears to that of the effluent water. If the wheel move as fast as the water issues, the retarding force will equal the impellant force,—or, the force necessary to give the water a motion as it enters the wheel, equal to that of the wheel, will equal the force of pressure or re-action; (see art. 3 and 15). In which case the machine will produce no effect. But if the wheel move half as fast as the water issues, then the retarding force will equal only half the pressure, and the effect will equal half the power.

18. To establish a rule for estimating the effect produced by re-action wheels: put V=the velocity of the effluent water: v=the velocity of the influent water, and w=the velocity of the wheel,—all in feet per second. Put m= the weight of water that issues per second, and g=the velocity acquired by falling one second. Then, by arts. 12 and 15 $(V+g)m$=re-action or impellant force; and $(w-v+g)m$=retarding force, or force necessary to give the water a velocity equal to that of the wheel; which, taken from the impellant force, leaves $(V-w\times v+g)m$=the preponderant force, which being multiplied by the velocity of the water, is reduced to $m+g(V-w\times v)w$=E, the effect.

But in the purely re action wheel the water enters the wheel without velocity, and $v=o$, whence $w-v=w$. Therefore the expression takes the form $E=m+g(V-w)w$.

This formula indicates that when $w=\frac{1}{2}V$ the effect is a maximum, and $E=\frac{1}{2}P$; but when $w=v$, or $w=o$, the whole expression vanishes, and $E=o$.

The practical rule deduced from this equation may be expressed in words as follows, viz,

RULE—To the velocity with which the water enters the wheel, add that of the effluent water, less that of the wheel; multiply this sum by the velocity of the wheel, and by the weight of water that issues in one second; and divide the product by the velocity acquired in falling one second (32) and the quotient will be the effect per second.

It may not be improper to state here that the expression $E=m+g(V-w\times v)w$, must be affected with the experimental co-efficient n, which varies according to circumstances that will be discussed hereafter.

(To be Continued.)

Interesting News Items.

The subject of penny postage has now been agitated for a number of years, its originator and chief advocate being the learned Blacksmith, Burritt.

It would be a great benefit to our people if such a postage reform were effected, as the price paid for a letter to Europe at present, is 24 cents, and a very large sum is paid by government every year for carrying the ocean mail. If letters can be carried by steamers across the Atlantic for the small sum of two cents, we consider it to be high-handed imposition of any government—American or British, to charge by special law 24 cents for each letter. That letters can be carried for two cents each, across the ocean, and that there are steamship companies ready to engage now in carrying them for that amount, is a fact no longer to be questioned, as the agent of the Glasgow and New York Steamship Company, in this city has come forward and offered to carry full cargoes of mail bags at the rate of two cents per letter, without asking any further grant from our own or the British government. We hope this offer will lead to a decisive reform in ocean postage.

The Pacific Mills. at Lawrence, Mass., have had an addition made to the main building——which is 506 feet long—of 300 feet; thus making the whole length 806 feet long, which makes it a very long factory indeed. It is to contain 100,000 spindles, 20,000 of which have already been set in operation.

We learn by the "Philadelphia Ledger," that a Mr. McGinnes, of Schuylkill Co., in that State, some two or three years ago, suggested the idea of facilitating coal mining operations by sinking perpendicular shafts, and opening the vein for working operations at several points. For two years he has been constructing the works, at an outlay of over $100,000, and has succeeded in demonstrating the feasibility of his plan. In the borough of St. Clair, he has leased 440 acres of land, under which tract lies a vein of coal thirty feet in thickness. This vein is open at two points, one by a slope or road passing down through and with the coal, a distance of three hundred yards, at an angle of fifteen degrees. At the bottom of this slope, gangways extend through the coal in various directions. At the head of the slope are two engines of twenty horse-power, to hoist the coal from the bottom. The capacity of the opening, therefore, is only limited by the power of the machinery to raise the coal, and the ability to prepare it for market. We hope that the introduction of this old and excellent system of mining into Pennsylvania will lead to a reduction in the price of coal in this quarter of the Republic.

To a number of correspondents we have merely to say that their communications have been received and are undergoing investigation.

What has become of Prof. Porter's "Æroport?" We have not heard of it for a long time. It is about time that we should hear something of it again. Surely the varnish of the oil-cloth case is now dry.

(For the Scientific American.)

The India Rubber Question.

I have been a reader of your journal from its first number. I have watched your progress from your smallest beginning, and am by no means surprised that your success has continued till the "Scientific American," if not the first journal of its kind on this continent, it, at least, occupies a place of which the mechanic and manufacturing age of the country may be proud. I do not address you now in a spirit of fault-finding in reference to your article of last week touching my relation to the Chaffee patent, for I have noticed in all your criticisms upon patent matters, a manly, elevated, impartial, and just tone, always looking for right and the greatest good to the greatest number, and always in the protection and defence of any man of genius, whether rich or poor, and always raising your voice against oppression and wrong, whether in legislation or administration, hence I do not find fault. But your article does me injustice, through applying my acts with respect to a fraudulently re-issued patent, as having had reference to this one.

When the Chaffee patent was about to be extended, I did oppose it, and one of the grounds assumed in that opposition was so unanswerable that an intelligent administration of the Patent Office would have refused the extension. 'Tis true that I denounced the Commissioner of Patents for the outrage upon the Laws, rules and practice of the Office in relation thereto, and I have nothing to take back or qualify in that respect. But you are under a misapprehension when you say that "after it was granted that I published a circular with the opinions of a number of lawyers attached, asserting that it was granted illegally," and hence your criticism upon my present relation to it, should look for other premises for its justification.

The acts of a Commissioner of Patents, however arbitrary, however unjust, in the matter of extensions of patents, you well know, are binding upon third parties, and though he may, under the act of Congress—making him sole judge of the facts and merits in all cases of extension by his acts, take millions of dollars from the public as in this case, and put it in the pocket of an individual or a company of speculators, yet such is the law, and its danger to the ends of strict justice, none will deny, and though under the mysterious ways of Providence, I am greatly profited by the result of that great outrage, yet I do not hesitate to condemn now, as I always, have, a Law which lodges such a dangerous power in one man. I do not care who is the Commissioner of Patents, the principle is wrong, dangerous, and should be changed. Will then the danger be less a danger should the law remain unchanged? The poor mechanics and inventors look to your journal as the leading representative of your honest wishes. Continue then to expose the wrong and encourage the right, and continue to do it fearlessly, regardless of who or where it hits; under our free institutions you have nothing to fear. You may rejoice to know that the good will remain a blessing to the country, and to a class of men who have done and are doing so much to advance the nation in greatness, power, and glory. Yours, HORACE H. DAY.

New York, March 16, 1854.

American Ships for England.

Mr. Donald McKay, of East Boston, has now on the stocks, nearly ready for launching, a beautiful clipper ship of 3,000 tons, having three decks, and being diagonally cross-braced with iron. He has also in frame a clipper ship of 4,000 tuns, which will store more cargo than the "Great Republic" would have done. Both these vessels are for Messrs. James Baines & Co., of Liverpool, and are intended for their line of Australian packets. Mr. McKay has also on the stocks a packet ship of 1,500 tons, and is making preparations to build four packet ships of 2,200 tons each, all of which are to be finished in ten months. The aggregate size of all these ships will be 17,300 tuns.

The British Government have rewarded Mr. Low, the inventor of the screw-propeller in use in the naval service of that power, with the sum of $50,000.

TO CORRESPONDENTS.

J. D., of N. Y.—It is almost unnecessary to say that we do not like to receive letters written with a pencil.

T. S. P., of Pa.—Get Bourne's Catechism of the Steam Engine, as an elementary work on the subject. Its price is only 75 cents. There is great danger in allowing the water of a boiler to fall below the fire line; an explosion takes place soon after the water is let in.

J. H., of Geo.—The holes in your sketch cannot weaken the walls seriously, but we would prefer common ventilators in the walls.

C. H. T., of L. I.—Beech boiled in oil will make excellent rollers and bearings.

A. H. K., of Vt.—The work you refer to is not authority; we refer you to the author of the articles on Water Wheels, which are now publishing in our columns. If you pay attention to the articles, you will obtain the desired information.

G. J., of N. Y.—The pump you have is as good as any other you can get; this is our opinion.

J. M., of Ill.—It will give us pleasure to examine your astronomical clock when it is constructed.

A. G., of Maine—There are many oscillating cylinders in this city, which open and close the steam ports without the use of any slide or puppet valve, but not by the same plan as you have presented.

A. Y, of Phila.—If you get the Encyclopedia of Chemistry, published by H. C. Baird, corner of Market and Fifth streets, your city, you will find an excellent article on magnets, and tables on the expansion of metals.

J. M., of New York—Do not inhale air through any mixture of lime or charcoal, it would be dangerous for you to do so; our advice to you is breathe the air full and free; bathe your spine and chest every morning and evening, and rub dry, and you will find your health improve.

T. McK., of Phila.—You could secure the design by patent, but not by caveat. The Committee could not use the design if you had it secured—otherwise they could: but we believe the design would not effect a complete preventive of alteration.

C. G. M., of Ohio—We published two tables on log and board measuring in our last volume and Stoddard's "Ready Reckoner" contains a number of tables.

W. T. W., of S. C.—You paid for the whistle in buying your soap receipt. Cut down some good brown soap and dissolve in water containing a little soda dissolved in it; add some scented oil, mould it, and let it dry thoroughly before using. Our softest bar soap becomes very hard when well dried.

C. D., of N. J.—The Grain Drier to which we referred may now be in use, for aught we know to the contrary. We saw the model in 1848: the inventor had it in our office for some days. Steam heat, which must be applied in a case cannot be patented, as its use is old and well known, and the revolving cylinder to dry vegetables, &c., is also well known; we are doubtful of a patent being obtained.

C. A., of N. Y.—A fire of anthracite coal burns out a boiler sooner than wood, because the heat is more concentrated. Steam has been employed in furnaces, but we advise you not to try it if you wish to economise fuel.

J. S. H., of Pa.—We can furnish you with a receipt for making the stearine candles from tallow, but it requires some capital to engage in the business. The best way to make the common dip candles is to dip them as warm as possible,

N. Y., of Ohio—You are right.

R. D. T., of N. Y.—The boiler that exploded at Hartford was a cylindrical one, with flues carried high at the sides. Although frequently solicited to say more about the "Ericsson," we do not deem it proper to do so at present.

U. B. V., of Pa.—We have carefully examined the sketch and description of your alleged improvement in constructing boats, and we are of the opinion that it does not possess novelty, neither do we regard it as having any advantage over the present mode of building.

J. W., of Ohio—We do not know the name of the makers of the ear instrument, any jeweller can make one from the engraving as we published it.

R. E., of Conn.—A cement was patented in 1852, composed of one half bushel of pulverized slacked lime, one fifth of a bushel of powdered rosin mixed with water sufficent to make the whole into a stiff mortar for a waterproof cement.

A. G., of Ohio.—We do not think very highly of your plan for propelling baloons. You might try it, this is the best and only way to determine its practical value.

B. F. D., of Phila.—We would prefer to use a larger single cylinder and cut off at one-third the stroke. You are right respecting the benefits to be obtained from a hot jacket surrounding the cylinder, all engines should have a jacket, but this is not new; locomotives have been constructed with their cylinders placed in the smoke box.

C. A. R., of Iowa.—It is common to find runners for sleighs made with hubs so as to adapt them to wagon axles. We have frequently seen them in this city and elsewhere.

A. J. C., of Pa.—An invention formaking enamel free from lead and tin was patented in 1852. The invention consists in the use of glass one part; lime or salt one-eighth. This combination is thoroughly pulverized and ground together with sufficient water to make it into a cream consistence, and then paint it on the ware with a brush, and afterwards expose it to the heat in the enameler's oven or furnace in the usual way.

A. W. A., of ——.—Communications not accompanied with the name of the writer are not attended to. We must know with whom we are doing business.

D. P., of N. Y.—We do not think there is any patentable feature in your improved tubular rail. We have sketches of the same kind of a rail in our possession.

C. R. B., of Pa.—There does not appear to be the slightest novelty in your alleged improvement in substitute for the crank. We look upon it as a useless contrivance for the purpose.

H. W., of Md.—You may depend upon it that if all the fans are constructed precisely alike they will blow alike.

E. F. B., of Phila.—You would see our comments in our last number. We are happy to hear of your useful improvements. The pencil you speak of has one defect which we could point out. We shall be happy to receive your communications.

D. B., of N. J.—Your plan would indeed be very expensive, but some such plan ought to receive a fair trial.

J. S., of Va.—In tempering axes you must be very careful and not heat them too high. It is not so much in the water or liquid in which you dip them, as the proper temperature to which you raise them.

Money received on account of Patent Office business for the week ending Saturday, March 25:—

P. S., of N. Y., $10; S. M. J. S., of N. Y., $35; D. H., of Ala., $35; W. E. D., of N. J., $30; R. A., of Tenn., $25; H. B. P., of N.Y., $10; W. D. T., of N. Y., $300; J. J. W., of N. J., $41; W. & W., of N. Y., $650; E. L. S. & Co., of Ga., $30; S. M., of N. Y., $4,75; L. W. C., of N. Y., $30; C. A. N., of Mass., $20; J. U., of O., $30; J. P., of Ky., $50; T. M. P., of Md., $25; T. P., of N. Y., $50; T. G. W. of N. Y., $30; W. S., of N. H., $20; S. H. D., of Mich., $32; A. N. N., of Ind., $30; J. S. C. T., of N. Y., $32; W. J., of N. Y., $30; A. B. G., of Mass., $30; H. L. T., of N. Y., $5; W. J. C., of N. Y., $37; W. T., of Ct., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 25:—

W. J. C., of N. Y.; J. H. W., of Ga.; J. J. W., of N. J. T. M. P., of Md.; H. L. T., of N. Y.; W. T., of Ct.; S. H. D., of Mich.; G. S., of N. Y.

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UNITED STATES PATENT OFFICE,
Washington, March 14, 1854.

ON THE PETITION of Willard Dalrymple, executor of Samuel Sawyer, late of Boston, Massachusetts, deceased, praying for the extension of a patent granted to the said Samuel Sawyer on the 10th of June, 1840, for an improvement in machine for cutting corks, for seven years from the expiration of said patent, which takes place on the tenth day of June, eighteen hundred and fifty-four, (1854)—

It is ordered that the said petition be heard at the Patent Office on Monday, the 29th of May next, at 12 o'clock, m.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing. All testimony filed by either party, to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 19th of May; depositions and other papers relied upon as testimony, must be filed in the office on or before the morning of the 20th May; the argument, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Evening Argus, Philadelphia, Pa.; Scientific American, New York; Post, Boston, Mass.; and Inquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 29th day of May next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy, and send their bills to the Patent Office, with a paper containing this notice. 29 3

UNITED STATES PATENT OFFICE.
Washington, Feb. 16, 1854.

ON THE PETITION of Samuel F. B. Morse, of Poughkeepsie, New York, praying for the extension of a patent granted to him on the 20th of June, 1840, for an improvement in the mode of communicating information by signals, by the application of electro-magnetism, for seven years from the expiration of said patent, which takes place on the 20th day of June, 1854—

It is ordered that the said petition be heard at the Patent Office, on Monday, 22nd day of May next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing. All testimony filed by either party, to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 12th of May: depositions, and other papers relied upon as testimony must be filed in the Office on or before the morning of the 13th May: the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York; and Inquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 22d of April next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy, and send their bills to the Patent Office, with a paper containing this notice. 26 3t

UNITED STATES PATENT OFFICE.
Washington, February 13 1854

ON THE PETITION of Samuel Blatchford, administrator of Orlando Jones, deceased, of Auburn, N. Y., praying for the extension of a patent granted to the said Orlando Jones, on the 30th day of April, 1840, for an improvement in the manufacture of Starch, for seven years from the expiration of said patent, which takes place on the 30th day of April, eighteen hundred and fifty-four—

It is ordered that the said petition be heard at the Patent Office on Monday, the 24th day of April next, at o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York; Post, Boston, Massachusetts and Enquirer, Cincinnati, Ohio, once a week for three successive weeks previous to the 24th day of April next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 25 3

Scientific Museum.

Burnt Lime as a Flux.

The study of the gases formed in blast-furnaces, with which the authors have been engaged for some years, has shown that the use of carbonate of lime as a flux is attended with great loss, and likewise that this loss may be obviated by using burnt lime instead. The gases were taken from a blast-furnace, 54 feet high, at Ougree, at thirty-two places, 1 foot apart, and the per-centage of carbonic acid determined.

It is evident from the examinations, that the carbonic acid is formed on the first introduction of atmospheric air, and within a remarkably short distance is reduced to carbonic oxyd, for the gas 8′ above the tuyers does not contain a trace of carbonic acid; however, the zone from which carbonic acid is entirely absent is of very limited extent; from 9′ to 10′ above the tuyer the gas again contains carbonic acid, and in no inconsiderable quantity.

The per-centage of carbonic acid in the gas increases at a height of 10′ or 11′ above the nose pipe, above which point a second re-action takes place between the carbon of the fuel and the carbonic acid, the per-centage of the latter decreasing up to a hight of 15′ above the tuyer, where it is 0. From this point it again increases in quantity, and rapidly, for at a hight of 30′ it amounts to 3.5 per cent. The authors ascribe this considerable increase of carbonic acid solely to the decomposition of the limestone used as a flux.

Thus after the increase of the per-centage of carbonic acid to 3.5 in consequence of the decomposition of carbonate of lime, it again diminished in proportion of the increased hight, until at a point from 37′ to 39′ above the tuyere it amounted to only 1.69 or 1.90 per cent., which may be regarded as about the quantity present in the gas before the decomposition of the carbonate of lime. Above this point the quantity of carbonic acid increases again up to the furnace-mouth, and indeed with tolerable rapidity and regularity, in consequence of the reduction of peroxyd of iron to protoxyd by the action of carbonic oxyd.

The authors are of opinion that the carbonic acid, which is disengaged from the limestone at a height of 27′ above the tuyere and again disappears almost entirely at a height of 39′, re-acts within this space upon the ignited coke, taking up part of its carbon; and an examination of the analysis confirms this view.

Although other observers who have studied the composition of the gases from the blast furnaces have not collected them at so many different heights, still their analytical results clearly indicate that in the furnaces from which they took the gas, the carbonic acid derived from the limestone was at least partially reduced to carbonic oxyd, as at Ougree. If carbonic acid is converted into carbonic oxyd by passing over ignited carbon, the action is essentially two-fold, a combination of carbon and oxygen, and a decomposition of carbonic acid into carbonic oxyd and oxygen; the former is accompanied by development of heat, the latter by absorption of heat. The practical question to be decided in the present instance is, which of these two calorific changes preponderates?.

Theoretrically, from the experiments of Dulong, there should be a considerable loss of heat.

These considerations led the authors to employ burnt lime in working blast furnaces, and thus to obviate the loss of heat. The experiment was commenced at Ougree in July, 1849. During the first few days the results were unsatisfactory, the management of the furnace was difficult, and the slags black and pasty. Subsequently, when taking into account the impurities of ordinary limestone, 63 parts of burnt lime were substituted for 100 parts of limestone; the working of the furnace, until it was let out at the beginning of 1851, was continually regular and good; during these eighteen months the most satisfactory results were obtained.—The saving of coke and increase of production were, as the experimenters anticipated, very evident; moreover, the raw iron was of better quality, and all the interior parts of the furnace, especially the tymp stone, remained in a much better state of preservation than when limestone was used. The following table gives the quantities of coke consumed, in the production of 100 kilogrms. raw iron, in the above-mentioned furnace, during the four months before and the four months after the alteration of the charging:—

WITH LIMESTONE.		WITH BURNT LIME.	
1849—March	150 0 kilogr.	1849—July	142 kilogr.
April	154·3 "	August	138 "
May	156·5 "	Sept.	133 "
June	151·5 "	Oct.	139 "
Average quan.	153·2 "	Average quan.	137·75 "

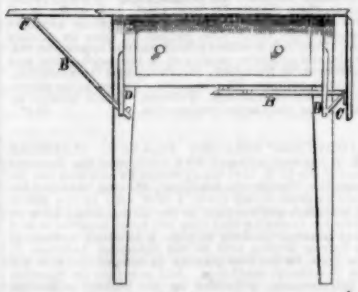
Average quantity consumed with limestone . . 153·20 or 100 per cent. coke.
Average quantity consumed with burnt lime . . 137·75 or 90 per cent. coke.
Difference. . . 15·47 or 10 per cent.

[Annual of Scientific Discovery.

Lowering Ship's Boats.

The annexed engraving represents a plan which has been illustrated and described in the "Glasgow Practical Mechanic's Journal," for lowering ships boats, as proposed by G. F. Russel, London. By this arrangement, although the boat possesses the great advantage of resting her whole weight upon the keel cranes, A, yet the very act of lowering at once disengages her from them without hoisting, at the same time projecting the boat several additional feet from the ship's side, as the link, B, straightens out, and as both the pendants, after passing over the heads of the cranes, lead to one barrel of the winch, both ends of the boat must be lowered together. When near the water, one man can disengage the boat fore and aft, by a single hand lever. The winch is placed flush with the staunchions inside the bulwark, and is fitted with a brake. One man on board can lower the boat when full; or by a lanyard fastened to the brake handle, a man in the boat can lower it by himself. The same tackle is always ready for hoisting the boat, and the winch being placed at a distance from the cranes, which turn inboard the boat can easily be brought on deck.

Supporting Table Leaves.



This engraving is a transverse section with the front legs removed, of an improved plan for supporting the leaves of tables, by Charles Phelps, of Salem Mass. It consists of three pieces of iron or any other suitable material, a brace in the form of a bent lever, a plate attached to the brace by which it is secured to the leaf of the table, and a rail plate upon which the lower end of the brace rests, to support the leaf when it is raised. In the figure B, is the brace, the upper end of which enters a slot in the plate, C, through which (and the end of the brace) a pin, or rivet passes making a hinge joint. On the upper part of the lower end of the brace, are two projections, and on the under side a spring, X, which is a strip of steel riveted to the brace. The rail plate is a piece of iron firmly secured to the rail of the table, and projecting about 2½ inches below it, through which at its lower end, there is an oblong opening wide enough for the brace to play through easily; across this opening there is a pin near its upper end.

The operation is as follows:—In raising the leaf from a perpendicular to a horizontal position, the brace B, is drawn through the aperture in the rail plate, till the spring and the end of the brace are compressed together by the projection upon the upper side of the brace passing under the pin which crosses the oblong opening or slot. (The other projection on the end of the brace is to strike the cross pin and prevent the brace from being drawn entirely out), after having passed under the pin, it is thrown up by the action of the spring directly in front of the pin, the projection leans back against the pin forming a firm rest for the brace which supports the leaf. When the leaf is up a pull at the short arm of the lever releases it by depressing the lower end of the brace and bringing the projection upon the side below the pin, to slide under it, and through the rail plate to a position parallel with the bottom of the table drawer.

A patent was granted for this improvement on the 29th of last Nov. (1853). The cost, we believe, is 30 cents per each table.

More information may be obtained by letters addressed to Mr. Phelps.

Project of an Iron Tunnel Under the Bed of the Ohio River.

Mr. Hitchcock, of Chicago, has sent a communication to the city authorities of Cincinnati, with the design of an iron tunnel for the tunneling of the Chicago river. The dimensions are sixteen feet wide, eighteen feet high—footage eight feet wide. The tunnel to be entirely constructed of cast or wrought iron. He says:

"Permit me to call your attention to my plan for building a tunnel under the Ohio river, opposite your city. It is proposed to use either cast or wrought iron. I propose to build a tube of iron of any desired dimensions, and sink it in the bed of the river, in sections, as low as may be found practicable, by first dredging a channel, deep enough to admit of the top being sunk below, or even with the bed of the river, entirely avoiding the use of coffer dams.—There is no question about the practicability and superiority of iron tunnels over all other materials, besides being about 100 per cent, cheaper. By my design, accompanying this, it will be seen that I put the foot-way at the top of my arch, the arch being as near a parabolic curve as practicable, combining strength and cheapness.

It is presumed that the design will answer for your city unless it proposed to lay down a railway through the tunnel, when I would propose putting the track in the top of the arch, in place of the foot-way. I would not in any event recommend running locomotives through, but simply the cars, by atmospheric pressure, as has been done in other instances. This would dispense with the necessity of a foot way, as passengers could go through very expeditiously by the cars. I also propose to make the approaches all of iron, as being cheaper and safer. I think, after a fair investigation, your honorable body will find that a tunnel can be constructed with much less expense, and more convenient for the public than a bridge."

Woolen and Cotton Mixed Goods.

There are many who think when they have purchased a piece of "cheap woolen goods," they have made a great bargain. There never was a graver mistake committed. Thousands and thousands of pieces of goods are sold in the shape of narrow and broadcloths, as being all wool, while in fact, they are composed of at least twenty per cent. of cotton. The latter is mixed and carded with the wool, and all being dyed the same color, it is very difficult to detect the imposition. We presume, that many merchants sell such goods under the belief that they are genuine—composed wholly of wool.—The manufacturers know all about the deception, and no doubt the great majority of the large merchants are aware of the fact also. Any imposition practised upon the community, in the shape of an article of manufacture deserves the severest censure. Cotton can easily be detected in any piece of goods, even when mixed in the process of carding, by submitting a small strip of the goods to the action of a little sulphuric acid, mixed with very hot water. The acid will discharge the color from the cotton, while the color of the wool will remain almost unchanged. There are very few colors, in cotton, but what are far more fugitive than those on wool; this is the reason, why the warm sulphuric acid solution is a good test for cotton in cloth.

War Steamers.

A Board of Naval Engineers and Captains has lately reported, that most of the steamers now employed in carrying the United States mail are unfit for military purposes, and could not easily be fitted out as men-of-war. It was however, admitted that the Collins' steamers might bear a small armament, and that they might all serve as transports. Captain Skiddy, one of the members of the Board, is of opinion that, with proper alterations, they might answer for war steamers of the first class. But supposing, for argument sake, that they can only be used as fast transports, would they not answer an admirable purpose in the time of war?

LITERARY NOTICES.

ROGET'S THESAURUS OF ENGLISH WORDS—So classified and arranged as to facilitate the expression of ideas and assist in literary composition. The American edition is published under the editorial supervision of Barnas Sears, D. D., Secretary of the Massachusetts Board of Education. This is a novel publication, and is the first and only one of the kind ever issued, in which words and phrases of our language are classified "not according to their sound or their orthography, but strictly according to their signification." It will become an invaluable aid in the communication of our thoughts, whether spoken or written, and hence as a means of improvement we can recommend it as a work of rare and excellent qualities, and one which should meet with an extensive sale. Published by Gould & Lincoln, Boston, Mass. For sale by Lewis Colby & Co., 122 Nassau street, New York.

ANNUAL OF SCIENTIFIC DISCOVERY FOR 1854.—This volume, published by Gould & Lincoln, of Boston, and ably edited by David A. Wells, A. M., has just been issued, and is, we think, still better than its very excellent predecessors. It is illustrated with a steel plate of Prof. Hitchcock, of Amherst College. The nature of the work is to present a clear outline of the physical discoveries and inventions of the preceding year, collating the information from a thousand various sources, and presenting much that has never before appeared in print. The editor has done his duty skillfully and scientifically, and has presented us with a mass of information as useful as it is varied; his notes on the progress of Science for 1853, which occupy 22 pages, are of themselves worth the price of the volume.

LITTELL'S LIVING AGE—This excellent weekly magazine, which is composed of selected articles from the ablest foreign magazines and reviews, is unequalled by any similar work in the world. Each number is embellished with a fine steel plate. The last number (514) contains an interesting article on the Works of Gray It is published by Littell, Son & Co., Boston.